AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. – 6.   (cancelled).

7. (currently amended). An automatic introduction apparatus for automatically introducing a target celestial object by controlling a rotation of an astronomical telescope around at least two axes, said apparatus ~~being characterized in~~ comprising:

an image-capturing means, which is adapted to capture an image of a celestial object at a plurality of focal distances;

a celestial object database; and

a celestial object identification means for identifying celestial objects each of which images has been captured ~~at each of the focal distances of~~ by said image-capturing means, by comparing said images of celestial objects captured by said image-capturing means with a set of celestial object information in said celestial object database, wherein

said automatic introduction apparatus is configured to perform an alignment process for defining a set of coordinate transformation information of a coordinate system in said astronomical telescope relative to a celestial coordinate system ~~is executed based on a set of position information for said celestial objects identified by said celestial object identification means~~ comprises an automated routine including:

(a) capturing an image of celestial objects by said image-capturing means;

(b) identifying a celestial object in said celestial object image;

(c) correcting said coordinate transformation information based on the position information of said identified celestial object; and

(d) controlling a rotation of said astronomical telescope so that said celestial object is introduced into a center of field in the captured image,

wherein said automated routine is repeated, using a focal distance of said image-capturing means that is shifted to a focal distance for a more telescopic side, until the celestial object is introduced into a center of field in the captured image with a sufficient precision.

8.   (currently amended). An automatic introduction apparatus in accordance with claim 7, ~~characterized in that~~

wherein an area of the current sky in which a field of view is not blocked is selected as a candidate area in which to capture the image by said image-capturing means in said step (a), before said routine is performed.

~~said alignment process includes the steps of:~~

~~capturing an image of a celestial object under a condition where said image-capturing means has been set at a focal distance for a wide angle side;~~

~~identifying a celestial object in said celestial object image captured at said wide angle side;~~

~~correcting said coordinate transformation information based on the position information of said identified celestial object;~~

~~selecting a fundamental celestial object from said celestial object image captured at the wide angle side;~~

controlling a rotation of said astronomical telescope so that said fundamental celestial object is introduced into a center of field in the captured image;

capturing an image of a celestial object under a condition where said image-capturing means has been shifted to a focal distance for a more telescopic side;

identifying a celestial object in said celestial object image captured at the more telescopic side;

correcting said coordinate transformation information based on the set of position information of said identified celestial object; and

setting said image-capturing means sequentially at different focal distances for the more telescopic side and repeating above respective steps until the fundamental celestial object is introduced into a center of field in the captured image with a sufficient precision.

9.   (currently amended). An automatic introduction apparatus in accordance with claim 8, in which said alignment process is executed by repeating said routine for each of at least two celestial objects.

using at least two fundamental celestial objects.

10.   (currently amended). An automatic introduction apparatus configured to perform a process for automatically introducing a target celestial object by controlling a rotation of an astronomical telescope around at least two axes, said apparatus being characterized in comprising:

an image-capturing means, which is adapted to capture an image of a celestial object at a plurality of focal distances;

a celestial object database; and

a celestial object identification means for identifying celestial objects each of which images has been captured ~~at each of the focal distances of~~ <u>by</u> said image-capturing means, by comparing said images of celestial objects captured by said image-capturing means with a set of celestial object information in said celestial object database,

said automatically introducing process ~~includes the steps of:~~ <u>comprises an automated routine including</u>:

<u>(a) capturing an image of celestial objects by said image-capturing means;</u>

<u>(b) identifying a celestial object in said celestial object image; and</u>

<u>(c) controlling said astronomical telescope to rotate so that said target celestial object is introduced into a center of field in the captured image based on the set of position information for said identified celestial object,</u>

<u>wherein said automated routine is repeated, using a focal distance of said image-capturing means that is shifted to a focal distance for a more telescopic side, until said target celestial object is introduced into the center of a field in the captured image with a sufficient precision.</u>

~~wherein said astronomical telescope is configured to be rotationally controllable so as to introduce said target celestial object into a center of a field of said astronomical telescope based on a set of position information for said celestial objects identified by said celestial object identification means.~~

11.   (cancelled)

12. (original) An automatic introduction apparatus in accordance with claim 10, in which said celestial object identification means has a function to extract an area including a celestial object that has not been image-captured based on said celestial object images captured by said image-capturing means and to determine whether said target celestial object exists in said area.

13. – 40. (cancelled)

41. (previously presented) An automatic introduction apparatus in accordance with claim 7, in which said celestial object database is renewed based on a set of celestial object information obtained via an electric communication means.

42. (previously presented) An automatic introduction apparatus in accordance with claim 7, in which

an initial parameter for said alignment process is established automatically based on a set of position information of celestial objects identified by said celestial object identification means.

43. (cancelled)

44. (previously presented) An automatic introduction apparatus in accordance with claim 10, in which said celestial object database is renewed based on a set of celestial object information obtained via an electric communication means.